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09/903,601	07/12/2001	Ryoichi Matsuoka	S004-4330	2216

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EXAMINER

KIBLER, VIRGINIA M

ART UNIT

PAPER NUMBER

2623

DATE MAILED: 07/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/903,601

Applicant(s)

MATSUOKA, RYOICHI

Examiner

Virginia M Kibler

Art Unit

2623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☒ Claim(s) 1-8 and 15 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☒ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. ____.  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date ____.   | 6) <input type="checkbox"/> Other: ____.                                    |

## **DETAILED ACTION**

### ***Priority***

1. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Japan on 7/14/2000. It is noted, however, that applicant has not filed a certified copy of the 2000-214847 application as required by 35 U.S.C. 119(b).

### ***Claim Objections***

2. Claims 1-8 and 15 are objected to because of the following informalities: "data;" should be changed to "data; and" in claim 1, line 14 and "means;" should be changed to "means." in claim 1, line 16. Appropriate correction is required.

Claims 2-8 and 15 depend on claim 1, and are thereby objected to.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 5-7 and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 5-7 and 15 recite the limitation "the superimposition displacement distance" in lines 2-3.

There are insufficient antecedent basis for this limitation in the claims.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 9-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Okubo et al. (5,872,862).

Regarding claim 9, Okubo et al. (“Okubo”) discloses extracting line segments for a subject pattern based on SEM image data for the subject pattern to be evaluated and acquiring SEM line segment data (Col. 5, lines 48-67, Col. 6, lines 1-23; Figure 1), and evaluating the subject pattern in two dimensions based on CAD line segment data corresponding to the subject pattern and SEM line segment data (Figure 1; Col. 1, lines 55-67, Col. 2, lines 1-13; Col. 6, lines 8-38).

Regarding claim 10, Okubo discloses the CAD line segment data is made based on data corresponding to the subject pattern of the CAD data (Col. 5, lines 48-67, Col. 6, lines 1-23; Figure 1).

Regarding claim 11, Okubo discloses evaluation items occurring in 2-D evaluation comprises pattern endpoints (Figure 1; Col. 8, lines 61-64).

Regarding claim 12, Okubo discloses the 2-D evaluation processing including a process of calculating superimposition displacement distances between CAD line segment data and SEM line segment data for noted line segments of a subject pattern (Col. 2, lines 14-28; Col. 9, lines 62-67, Col. 10, lines 1-10).

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okubo et al. (5,872,862).

Regarding claim 1, Okubo discloses designating means for designating using CAD data a subject pattern to be evaluated (Col. 5, lines 15-21; Col. 7, lines 31-37), means for acquiring CAD line segment data corresponding to SEM image data for the subject pattern and the subject pattern in response to the designation means (Col. 8, lines 30-64), means for performing line segment extraction for the subject pattern based on SEM image data in order to obtain SEM line segment data (Col. 9, lines 5-60), and evaluation processing means for subjecting the subject pattern to 2-D evaluation processing based on the CAD line segment data and the SEM line segment data (Col. 9, lines 62-67, Col. 10, lines 1-10). Okubo discloses a displaying means for displaying CAD data and the SEM image data (Col. 13, lines 49-65), but does not appear to recognize displaying the evaluation results. However, displaying evaluation results is a well known and routinely utilized methodology. It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the evaluation disclosed by Okubo to include displaying the results because it provides the user with a visual aid thereby creating a user-friendly device.

Art Unit: 2623

Regarding claims 2-4, the arguments analogous to those presented above for claims 10-12 are applicable to claims 2-4, respectively.

9. Claims 5-8 and 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okubo et al. (5,872,862) as applied to claims 1 and 12 above, and further in view of Miyano et al. (6,363,167).

Regarding claims 5-8 and 13-16, Okubo does not appear to recognize comparing the superimposition displacement distance to a prescribed reference value. However, Miyano et al. ("Miyano") discloses evaluating a shape of a pattern of a SEM image based on CAD data and comparing to a prescribed reference value (Abstract; Col. 4, lines 20-23). Miyano further discloses displaying the results using different levels wherein the different levels are displayed using patterns for each level on a wafer map (Col. 5, lines 29-67, Col. 6, lines 1-5). Okubo and Miyano are combinable because they are from the same field of endeavor of inspection. At the time of the invention, it would have been obvious to one of ordinary skill in the art to have modified Okubo's evaluation to include shape judgment criterion. The motivation for doing so would have been because including the shape judgment criterion will expand the versatility of the system to encompass discerning between pass and fail of fine patterns and classification of discerned failures. Therefore, it would have been obvious to combine Okubo with Miyano to obtain the invention as specified in claims 5-8 and 13-16.

#### ***Other Prior Arts Cited***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Art Unit: 2623

U.S. Pat. No. 5,561,293 to Peng et al. for failure analysis with CAD layout navigation and FIB/SEM inspection;

U.S. Pat. No. 5,604,819 to Barnard for determining offset between images of an IC;

U.S. Pat. No. 6,246,787 to Hennessey et al. for knowledgebase generation and management;

U.S. Pat. No. 6,334,097 to Yoshitake et al. for determining lethality of defects in circuit pattern inspection and selecting defects to be reviewed and inspection system of circuit patterns;

U.S. Pat. No. 6,727,929 to Matsuoka for wafer inspecting; and

Kwang et al., "CAD Driven High Precision E-Beam Positioning," IEEE 1993, pages 928-935.

### ***Contact Information***

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Virginia M Kibler whose telephone number is (703) 306-4072. The examiner can normally be reached on Mon-Thurs 8:00 - 5:30 and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on (703) 308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2623

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Virginia Kibler  
06/27/04

MEHRDAD DASTOURI  
PRIMARY EXAMINER

